Less CO₂ in International Shipping: Researchers Recommend Fuel Levy

Emissions from shipping must be reduced, according to a recent decision made by the International Maritime Organization (IMO). New concepts are now being sought to reduce CO₂ emissions by at least 50% in comparison to 2008. One possibility is market-based measures, such as a levy on fuel. But what would be the consequences for international shipping? In one of the first studies on this topic, Professor Michele Acciaro and PhD candidate Vasileios Kosmas from Kühne Logistics University in Hamburg have conducted a scientific examination of the economic and ecological effects of fuel levies. They have come to the conclusion that these will create significant incentives for investment in environmentally friendly technologies in the medium term. However, in the short term, they will also lead to reduced speeds and higher costs.

"A levy on fuel is in line with the ‘polluter pays’ principle. Anyone who produces emissions must also pay for them," explains Acciaro, Professor of Maritime Logistics at KLU. "We assume that the additional costs will initially be cushioned by shipping companies through slower, fuel-efficient sailing." However, ships in international freight traffic cannot be slowed down indefinitely. "In the medium term, shipping companies will have to find other ways to increase the energy efficiency of their ships. In the long run, the fuel levy will therefore lead to investments in more environmentally friendly technologies."

However, the necessary investments are costly. "Depending on the market situation, shipping companies will try to pass these costs on to their customers," says Kosmas. "With favorable conditions for ship owners; with high freight rates and low overcapacities, a large part of the additional costs will reach the customers directly." In dire times, such as the shipping crisis that has been ongoing since 2008, Acciaro and Kosmas recommend support for shipping companies. "If ship owners make little profit in their daily business and let their ships sail almost free of charge due to a lack of demand and overcapacities, they
have hardly any opportunity to invest in environmentally friendly technologies," says Kosmas. "In this case, the fuel levy could be combined with financial support through a reimbursement scheme to encourage the introduction of new technologies." In addition, Acciaro and Kosmas propose to invest part of the funds raised by the levies in research into environmentally friendly technologies.

There are two different models for the proposed fuel levy: a unit levy, in which a fixed amount must be paid for each ton of fuel, or an *ad valorem* levy based on the price of fuel. "A major difference lies in the predictability of the charges for shipping," Kosmas explains. "With a unit levy per ton of fuel, future costs can be estimated relatively easily on the basis of past consumption. An *ad valorem* levy would create more uncertainty as the price of fuel would also change the level of the levy. To avoid creating even more uncertainty and volatility in the industry, we recommend a unit levy."

At present, shipping accounts for around three percent of global CO₂ emissions, which is roughly equivalent to Germany's share. "As world trade grows, international shipping traffic will increase, and thus also the CO₂ emissions," Acciaro points out. "IMO's goal is to reduce emissions by half compared to 2008 – with more routes traveled. So we'll have a lot of work to do until 2050."

The IMO decision is an important signal for climate protection. As international maritime transport is not included in the Paris Climate Agreement, it is the first effort to reduce greenhouse gases in shipping at all. The IMO is a specialized agency of the United Nations whose agreements determine the regulations for shipping in member countries.

About KLU

Kühne Logistics University – Wissenschaftliche Hochschule für Logistik und Unternehmensführung (KLU) is a private university located in Hamburg’s HafenCity. The independent, state-certified university focuses on the areas of logistics and management. With one BSc and four MSc degree programs, a PhD program, and a part-time Executive MBA, KLU offers its 330 full-time students a high level of specialization and excellent learning conditions. In open, customized management seminar series, industry specialists and managers benefit from the application of academic findings to practical issues.

KLU has an international team of 23 professors who teach in English. The programs are oriented toward students from Germany and abroad. Research at KLU is concentrated on the Key Competence Areas of Digital Transformation, Creating Value, and Sustainability for the benefit of transportation, global logistics, and supply chain management.

In 2017, KLU was granted the right to confer PhD degrees, making it one of only 15 among the 118 private universities in Germany permitted to confer their own PhDs. In the newest CHE university rankings, KLU obtained the highest ranking in all major criteria.

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